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Title : Assessing Prey Size and Fishery Overlap Using Bones from Scats and Applying Digestion Correction Factors

Category : Ecology

Student : Not Applicable

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Abstract : The large commercial fishery for walleye pollock (*Theragra chalcogramma*) in Alaska has raised concerns about whether fisheries take the same size fish as Steller sea lions (*Eumetopias jubatus*). In general, Steller sea lions are thought to consume smaller fish based on otoliths recovered from stomachs in the 1970s and 1980s and the correlation between fish size and otolith length. We tested whether this was still the case in the 1990s by developing a method that corrects for partial bone digestion and uses six diagnostic bones in addition to otoliths to estimate fish size. Bones were graded into good, fair, or poor condition categories. Experimentally derived condition-specific digestion correction factors were then applied to selected bones, and fish lengths were calculated from allometric regressions. Applying this method to pollock bones recovered from 531 scats collected in Southeast Alaska between 1994-1999 increased the estimated mean fork length of fish consumed by 23%, to 42.4 +/- 11.6 cm (range=10.0-78.1 cm, n=909), increased the mean mass of fish consumed by 88%, and doubled the potential overlap with a nearby fishery (from 24% to 52%). The contribution of juvenile pollock (<20 cm) to the sea lion diet in Southeast Alaska was insignificant during the 1990s, with adult pollock (>45.0 cm) contributing 44% to the diet by number and 74% by mass. These findings highlight the importance of using bones other than otoliths (which are usually severely eroded), as well as digestion correction factors to reliably estimate the size of sea lion prey and to determine the extent of overlap with fisheries.